History Speech

Every single person in this room should be able to recognize this device. It’s a cell phone and we recognize it because we use it so often every day. However, about two hundred years ago, a device was invented that has a similar feature as the cell phone’s feature of texting: it was the telegraph. All most people know about the telegraph was that it was invented by Samuel Morse. But there is much more to know about it than that. Today I am going to tell you more about Samuel Morse and the invention of the telegraph.

Samuel Morse: The Invention of the Telegraph by *Alisa Finkbeiner*

And these are my objectives: After my presentation all of you should be able to summarize the events in Morse’s life and how the telegraph was invented and you should be able to determine the effects of the invention of the telegraph on our lives today.

Samuel Finley Breese Morse was born on April 27, 1791 in Charlestown, Massachusetts. He was the first of three sons and his parents were Jedidiah Morse, a clergyman and Elizabeth Breese. As a child he was said to be the most temperamental out of all his brothers. His parents called him by his middle name Finley. By the age of seven, Samuel Morse went to the Phillips Academy to get an education. He was not a perfect student, but his drawing skills were pretty good. Both his teachers and his parents encouraged him to draw and soon he had success drawing small little portraits on ivory. In 1810, at the age of nineteen, Samuel Morse graduated from Yale College. He then wanted to pursue a career in art but his father would not let him, so he took a job as a clerk in a bookstore in Charlestown. However, he still continued to paint. One year later, Samuel Morse’s father reversed his decision and let him pursue his dream career of being a painter. To do that, Samuel Morse travelled to England where he worked at the Royal Academy where he worked with the American artist Benjamin West. In 1815, Morse was done studying art so he came back and set up an art studio in Boston, Massachusetts. He then had problems finding work with his painting so he moved to New York in 1823. Two years later he painted his probably best-known painting of Marquis de Lafayette, a French general who served in the Revolutionary War in Washington D.C. This is the painting and you might have seen or heard of this French General. In 1826 one of the probably most important events in Samuel Morse’s life happened: He became one of the founders and the first president of the National Academy of Design. This organization was securing sales for artists and also raised the taste of the public. When in the next two years of his life, his wife, father and mother died, Samuel Morse went to a trip in Europe to recover from his loss of family and loved ones. This trip became probably the most important in his life because during the trip, Samuel Morse will learn something that later made him famous forever.

The idea of a telegraph has been used for a very long time. Hundreds of years before Morse, people used fire, smoke, flags or light to send and receive messages over distances. This was called a visual semaphore system or the optical telegraph. The French engineer Claude Chappe is said to have invented the first real system of optical telegraphs. This is his optical telegraph. It was a tall tower with an bar that was about thirteen feet long on top of it and on each end of that bar was another bar that was about six feet long. By using ropes in the tower, the bars could be put into 196 different positions and people at another tower would use a telescope to see the sign and put it up for the next tower to see. That way, news traveled fast but somehow, this system never really came through and Claude Chappe never really became famous in any other country than France.

The first electrical telegraph was invented by Francisco Salva in 1804 in Barcelona, Spain. His electric telegraph used thirty five wires and was really impractical and that is why he and his telegraph never became famous.

Four years later, in 1808, the German physicist and inventor Samuel Thomas von Sömmering invented another telegraph similar to Francisco Salva’s. He presented it before the Munich Academy of Science. This is a picture of it. And this is how it worked: There were thirty-five wires, one for each letter of the alphabet and a few numbers. The wires were each connected to an electrode, which is a conductor that con conduct current to nonmetallic materials. The electrode is immerged in a glass tube filled with acid. When an electric current was sent over the wires, the electrode caused bubbles to appear in the acid. According to where the bubbles appeared, a person could read a message. Samuel Thomas von Sömmering‘s telegraph system was better than Francisco Salva’s because he used stronger batteries and that is why he was able to send messages over longer distances up to 2.2 miles. That might not be much, but Francisco Salva’s telegraph system’s messages were sent over an even shorter distance.

In 1816, British inventor Francis Ronalds invented a primitive version of a telegraph. On his grounds in London, he built an eight miles long wire with big wooden frames on each side. The wooden frames were connected to a clockwork which was connected to a dial that had the letters of the alphabet on it. That way, messages could be easily transmitted over long distances. Francis Ronalds even believed that his invention would work over 500 miles. However, he never got to try it out because the government did not feel it was necessary to fund a telegraph during a time where there is no war because that is what telegraphs were mostly used for during that time.

In 1820, the galvanometer was invented and one year later, Andre Marie Ampere came up with the idea that telegraphy could be done by a system of galvanometers and succeeded in trying this. However, three years later Peter Barlow said that such a system would only work for a distance of two hundred feet which made the idea of telegraphy by using galvanometers impractical.

In 1825, the electromagnet was invented by the British electrician William Sturgeon. This was another invention besides the galvanometer that helped the improvement of the telegraph.

In 1832, a Russian engineer, Pavel Schilling invented the first electromagnetic telegraph. This is a picture of it. This telegraph worked by using galvanometers and a keyboard. When the keys on the keyboard were pressed, current would go through the wire and the galvanometer would turn a small piece of paper that was black on one side and white on the other. His telegraph worked over a distance of three miles. The fact that I did not find much information on Pavel Schilling proves that he and his telegraph never really became famous.

The next telegraph was developed by two German engineers, Carl Friedrich Gauss and Wilhelm Weber in Goettingen. It used magnetometers and galvanometers. They developed and alphabet and the person on the other end of the line was able to read what was being sent based on the amplitude of the needle. They even received funding for their telegraph and were able to build a line along a railroad.

The First American electric telegraph was invented in 1836 by Dr. David Alter in Elderton, Pennsylvania. That is exactly one year before Morse invented his electric telegraph. Dr. David Alter presented his telegraph before a group of people but never really thought about developing a practical system of telegraphs.

The last telegraph invented before Samuel Morse’s telegraph was the Cooke and Wheatstone telegraph. It was developed by William Fothergill Cooke and Charles Wheatstone in London in 1837. It used galvanometers with needles. As you can see in this diagram, the needles were pointing to letters on a board. Unfortunately, this telegraph had many disadvantages. Firstly, it only had 20 letters so six of the letters could not be written. Also, it did not write lowercase nor did it have any punctuation marks. Another disadvantage was that it required five wires.

As I have told you before, Morse went on a trip to Europe to recover from the shock of the death of his wife, father and mother in 1826. When he returned home to the United States in 1832, he learned about telegraphs and electromagnetism on the boat from a Charles Thomas Jackson. That was the first time Samuel Morse heard about that and he soon became very interested in that topic. On the ship, he made some sketches of what a telegraph has to include and how it could look. He discovered that a telegraph only had three major parts: a sender, a receiver and a code. In the following years, he became art professor at the University of the City of New York and in his free time he attended lectures on electricity. By January 1836, Samuel Morse had developed a working model of a telegraph. He presented it to a friend who told him about the new technologies in electromagnetism which helped Morse to improve his device.

While Samuel Morse worked on his dream of inventing a one-wire telegraph he hired two helpers. The first one was Leonard Gale who was professor of science at the New York University and Alfred Vail who helped with his mechanical skills and provided his family’s New Jersey iron works to construct better telegraphs. Those are their pictures.

By September 1937, those three men had constructed a working telegraph and invented the Morse code, which used dots and dashes as most of you probably know. This is a picture of the Morse code and you have one on the handout I gave you. Samuel Morse applied for a patent for the machine and he demonstrated his device in public. This is a picture of the telegraph Morse and his helpers created. It consisted of a transmitter and a register or recorder. This is the transmitter and this is how it works. First to start sending a message, the telegrapher had to close this connection so that the electrical circuit can be closed. Then there is a lever which closed the circuit completely. According to the Morse Alphabet, the telegrapher knows how long and often he has to push the lever down. This is a picture of the register or recorder. It works by using an electromagnet, gears and a lever. When an electric wave is passed through the machine, the electromagnet gets activated causing this magnetic iron part of the lever to be attracted to the electromagnet. The lever goes up and indents the paper which is located right there and moving. If the electric wave is short, the lever creates a dot and if the electric wave is longer, it creates a dash. This allows a telegrapher at the receiving end of the line to just decode the message and give it to the person who is to receive it.

After Morse invented the telegraph, nothing much happened because he could not demonstrate it over a long distance. Only five years after Morse had completed his telegraph, Congress financed $30,000 to build a telegraph line between Washington D.C., the nation’s Capital and Baltimore, Maryland. On May 11, 1844, Samuel Morse sent his first intercity message and soon after that he sent the first message from the Supreme Court in Washington D.C to the Mount Clair Train Depot in Baltimore. This message was “What hath God wrought?” and was borrowed from the Bible. The daughter of the Commissioner of Patents had selected it.

After this event, the telegraph started spreading in the United States faster than the railroads had. Private Companies build telegraph lines using Morse’s patent and by 1846 they had build telegraph lines from Washington to Buffalo and Boston. 23,000 miles of telegraph wire were in operation by 1854. In 1851, the Western Union was founded, and in 1866, the first successful trans-Atlantic telegraph link was established. The telegraph started to spread all over the world.

Now it is time for you to be a telegrapher and decode some Morse Code messages. Here they are. I am going to give you a few minutes to decode them and then you can tell me what they mean.

Now you might wonder what the telegraph has to do with all of us today and why we should care about technology that was invented over hundred years ago because we have more advanced technology today. Well, the Morse code is still used today. For example by the Maritime, Military and Amateur Radio Services. People use the Morse code also just for fun. Probably the most common it is used when ships are in danger. For example, the Titanic used Morse Signals to call for help.

The importance of the telegraph today is that it was the start of technology in communication. It was the start of more advancement in communication technology. Because of all those people who worked to improve the telegraph, our new communication improved, too. Because all of those people helped to invent the telegraph, technology advanced allowing people to then invent the telephone, the cell phone and the internet. If the telegraph had not been invented, our technology might be different today, so all the people who developed the telegraph technically also helped with our technology today.

My theme the telegraph relates to the Unit theme Expansion because after the telegraph was invented it expanded over all of the United States and Europe too. Also, the telegraph probably was a reason that people were not worried of not having a way to contact family members that moved away so the American people expanded more away from each other knowing that with the telegraph, they could keep contact with their family.

So you can see that the invention of the telegraph is more than just some person inventing some old machine that is not used anymore today. This event impacts today and our technology might be different if it had not been invented back then.